

FIG. 1

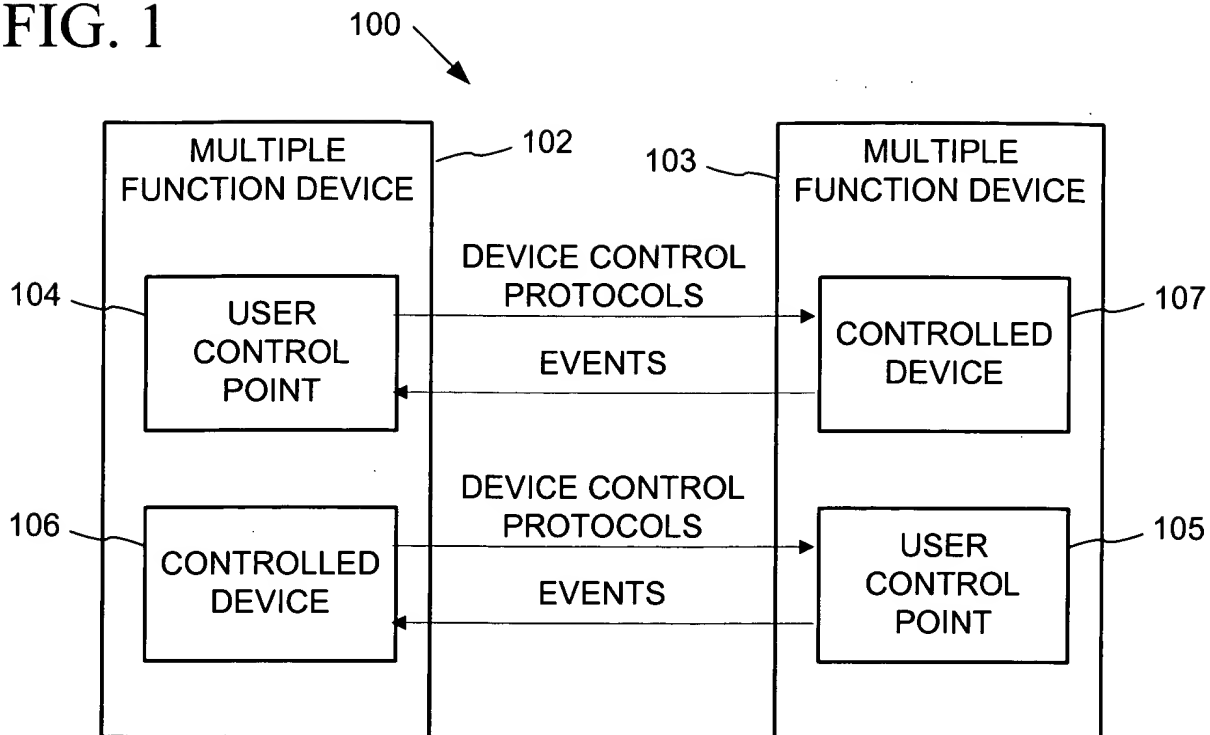
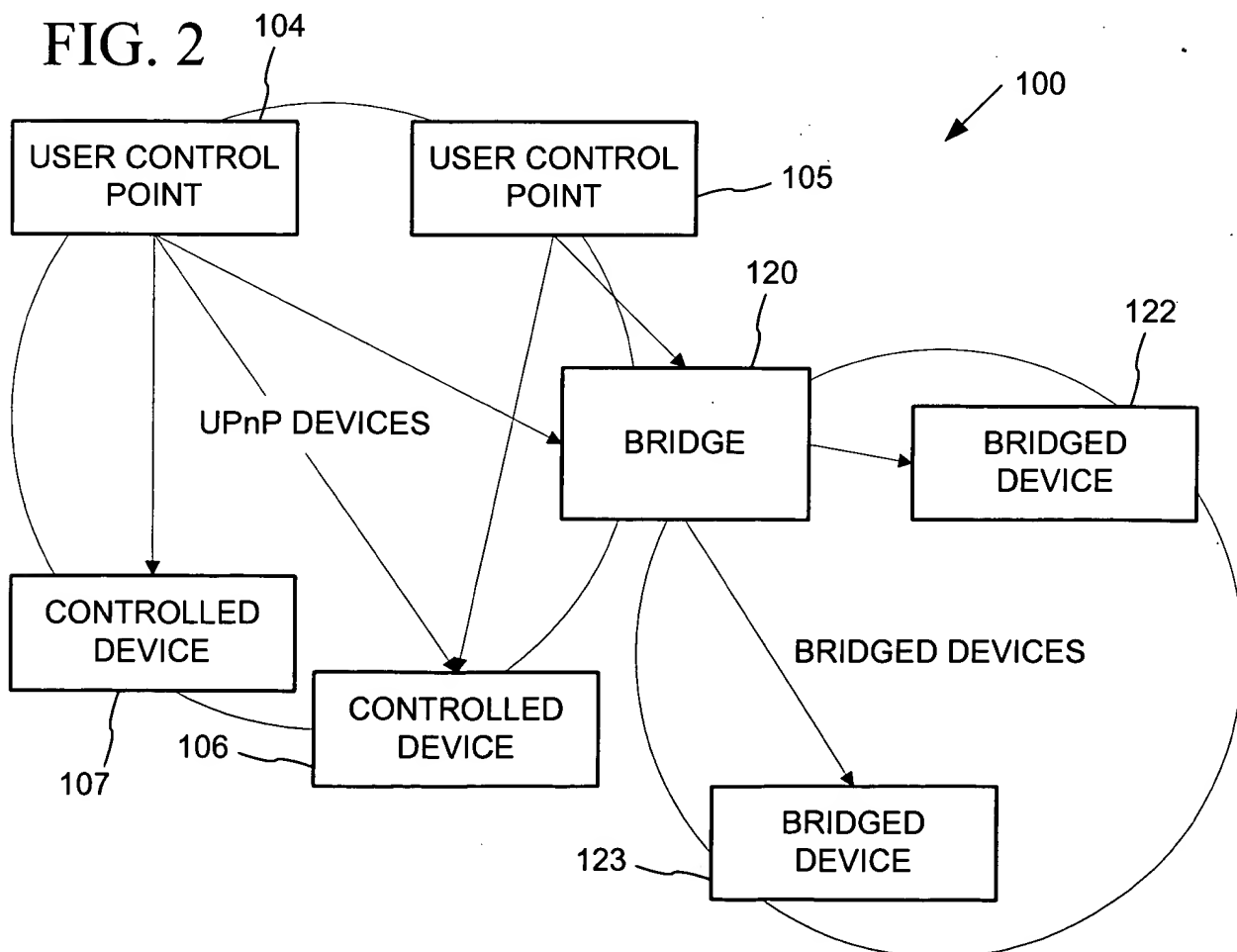


FIG. 2



David L. Forster

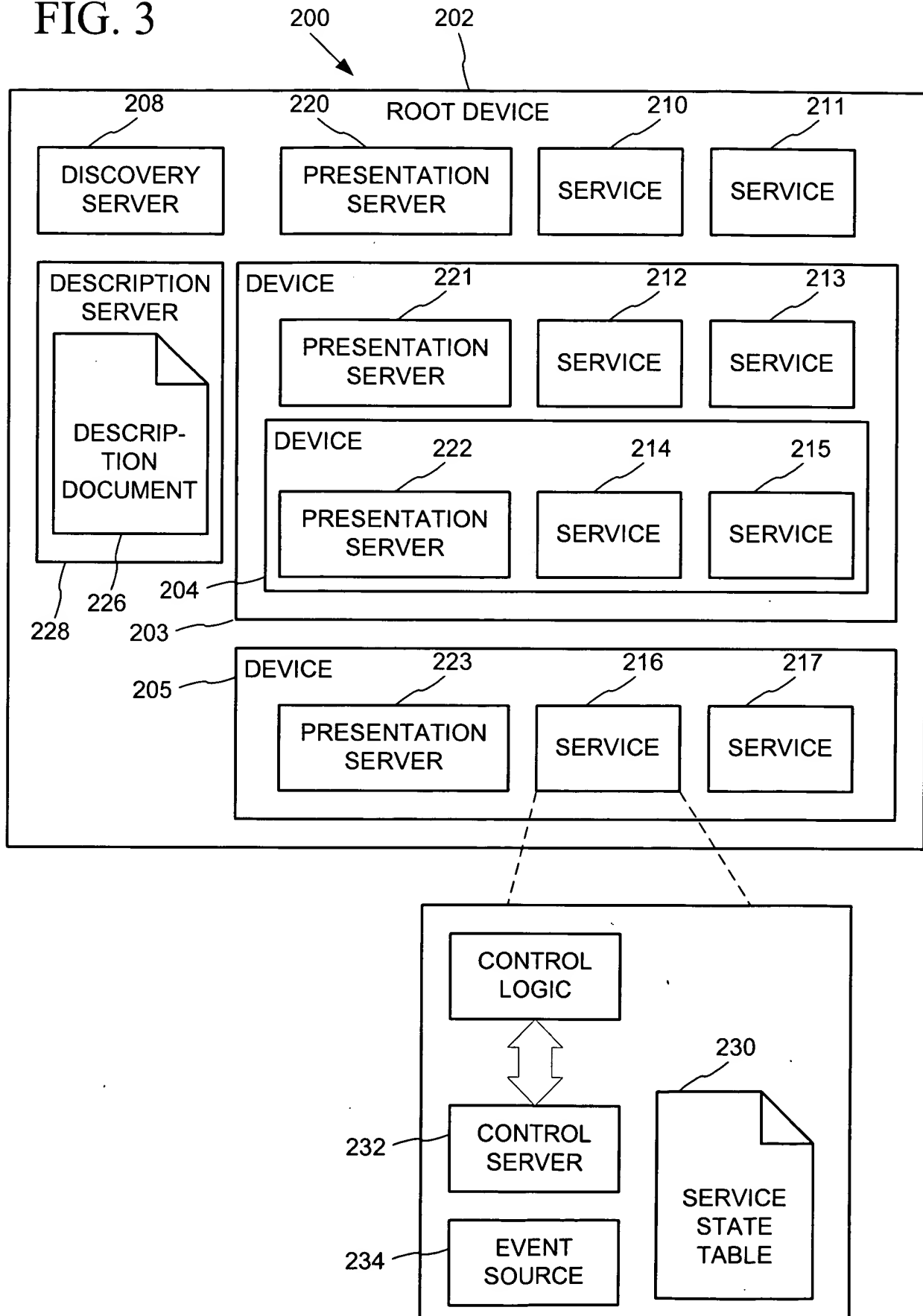
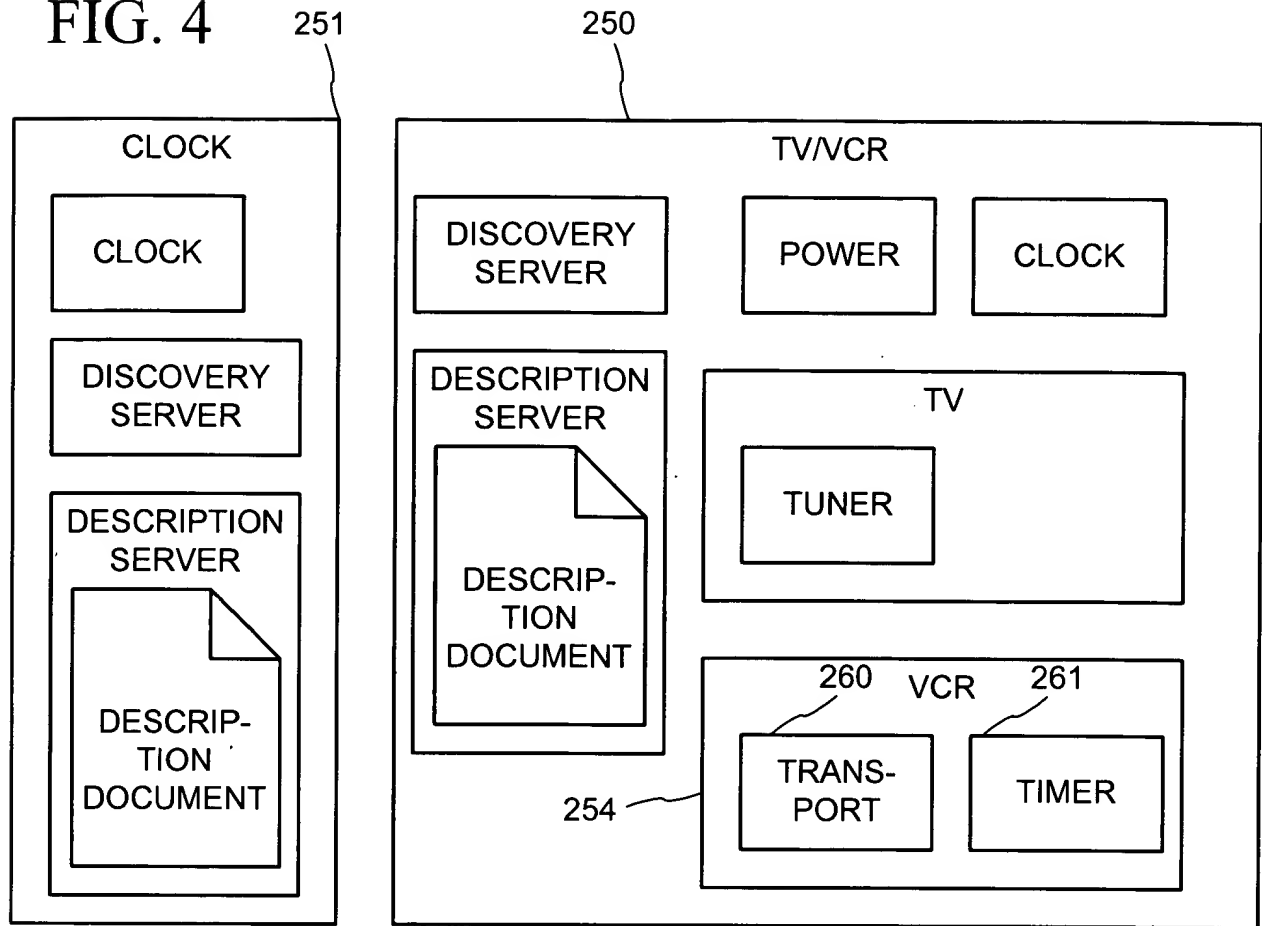
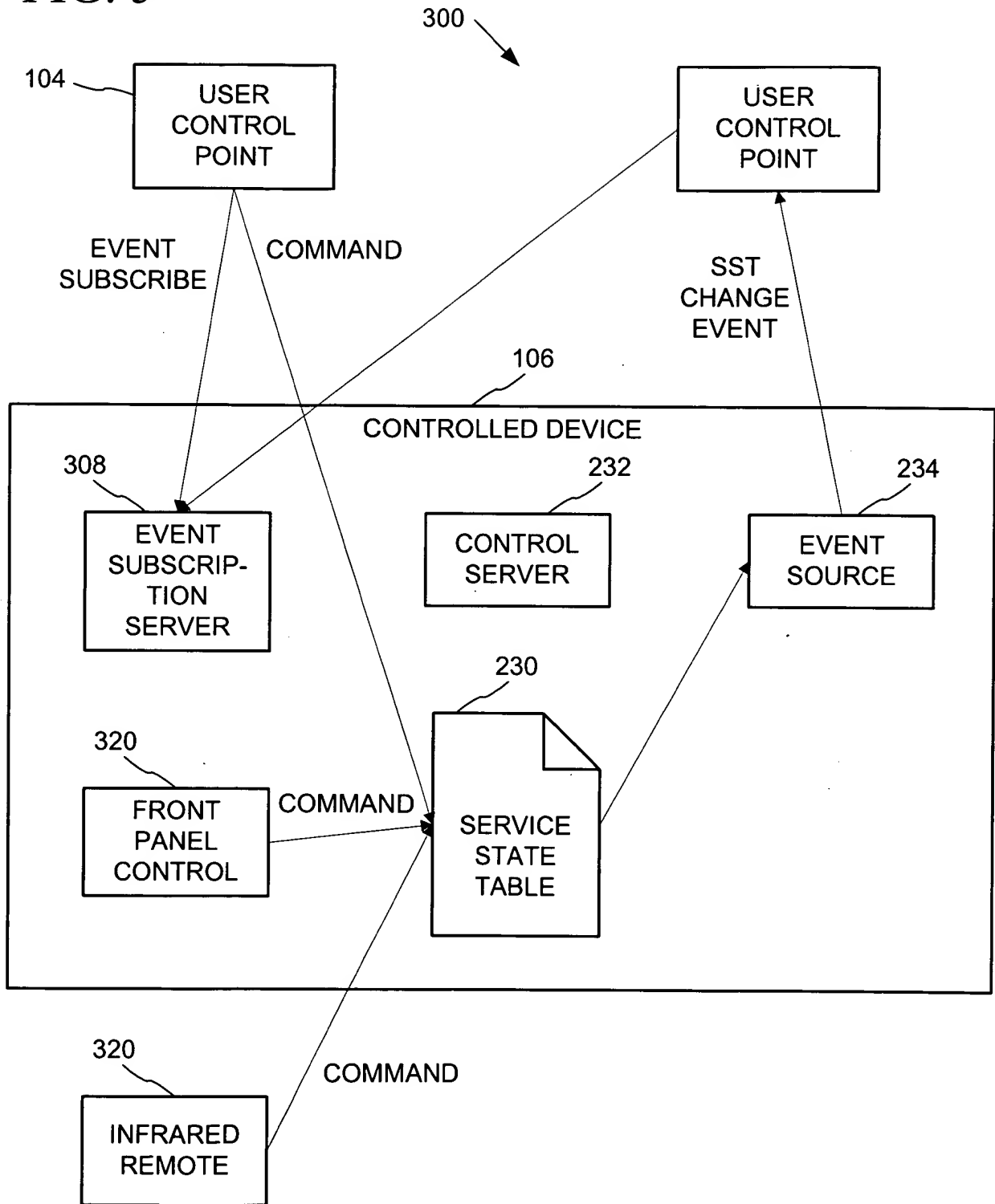


FIG. 4



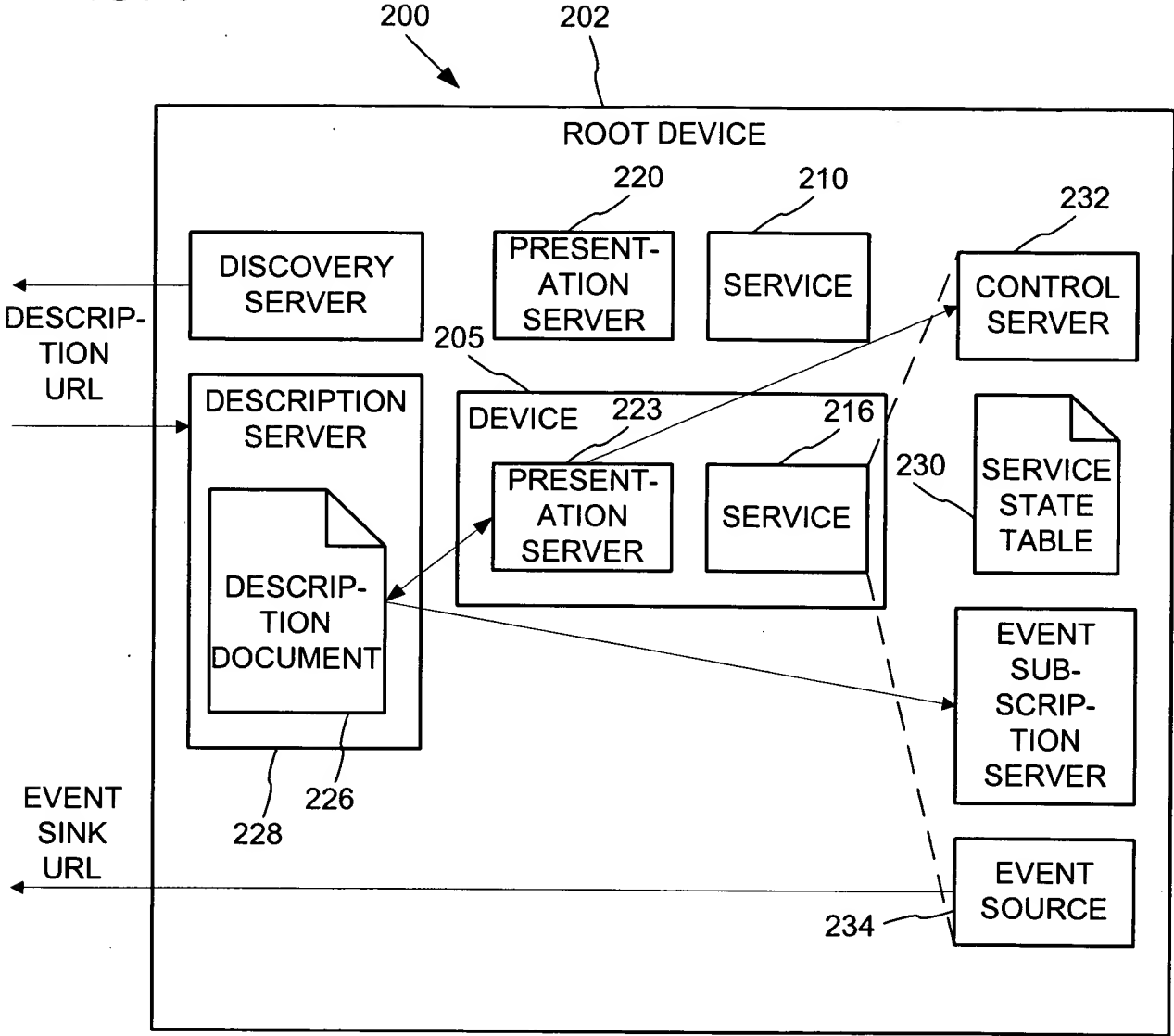
09706446-140200

FIG. 5



09706446-1-00000

FIG. 6



09706445-110000

SECRET

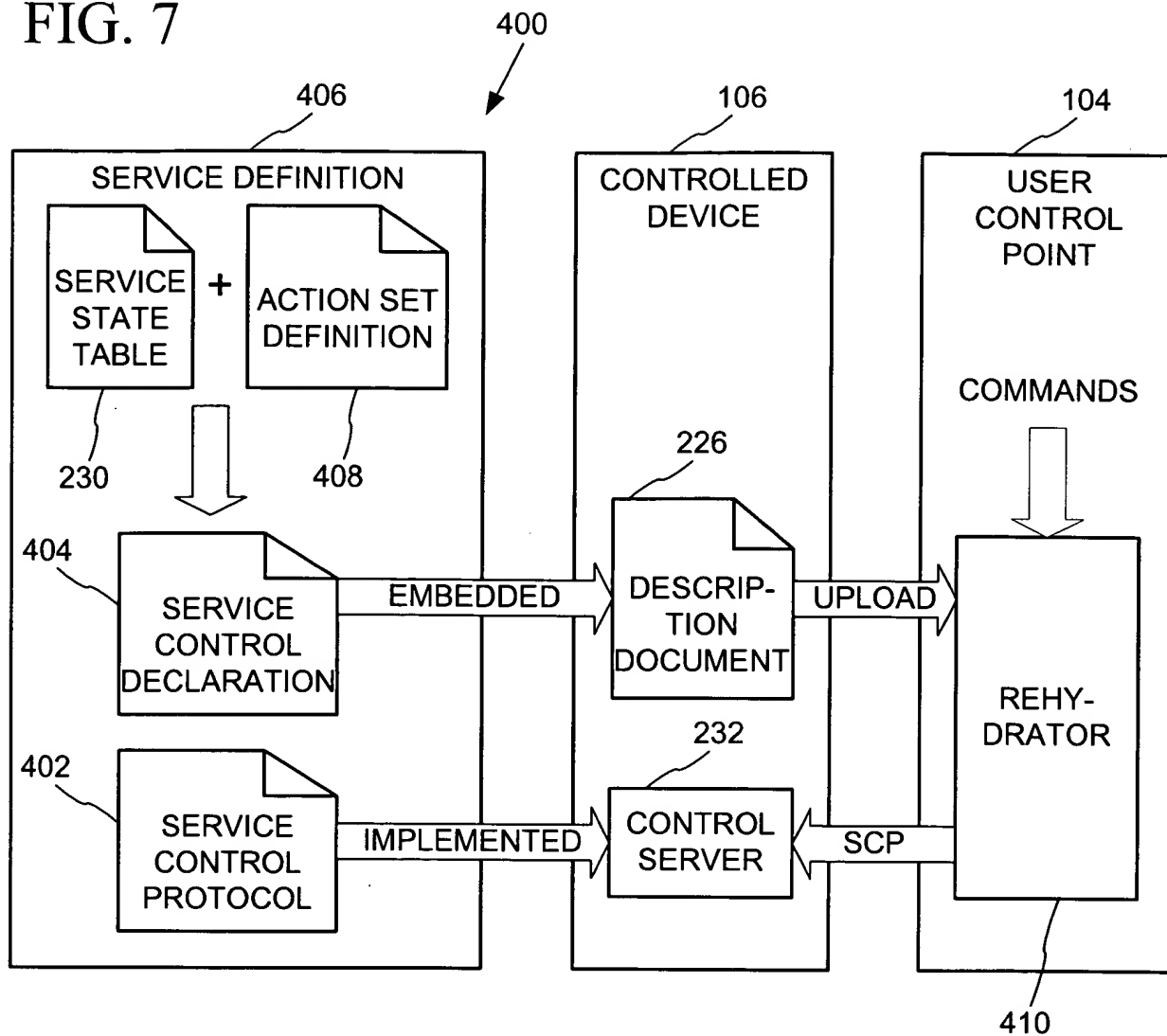
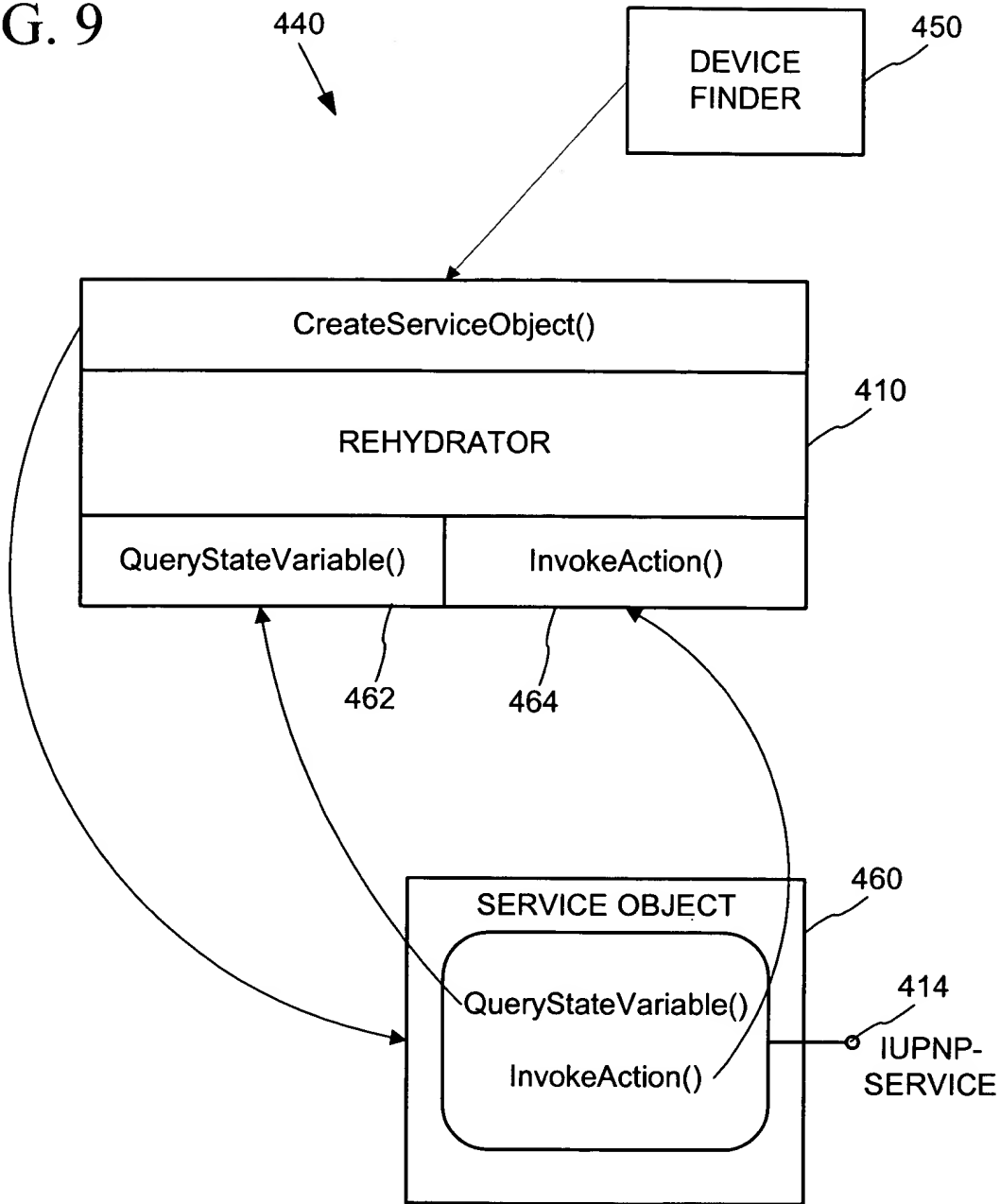
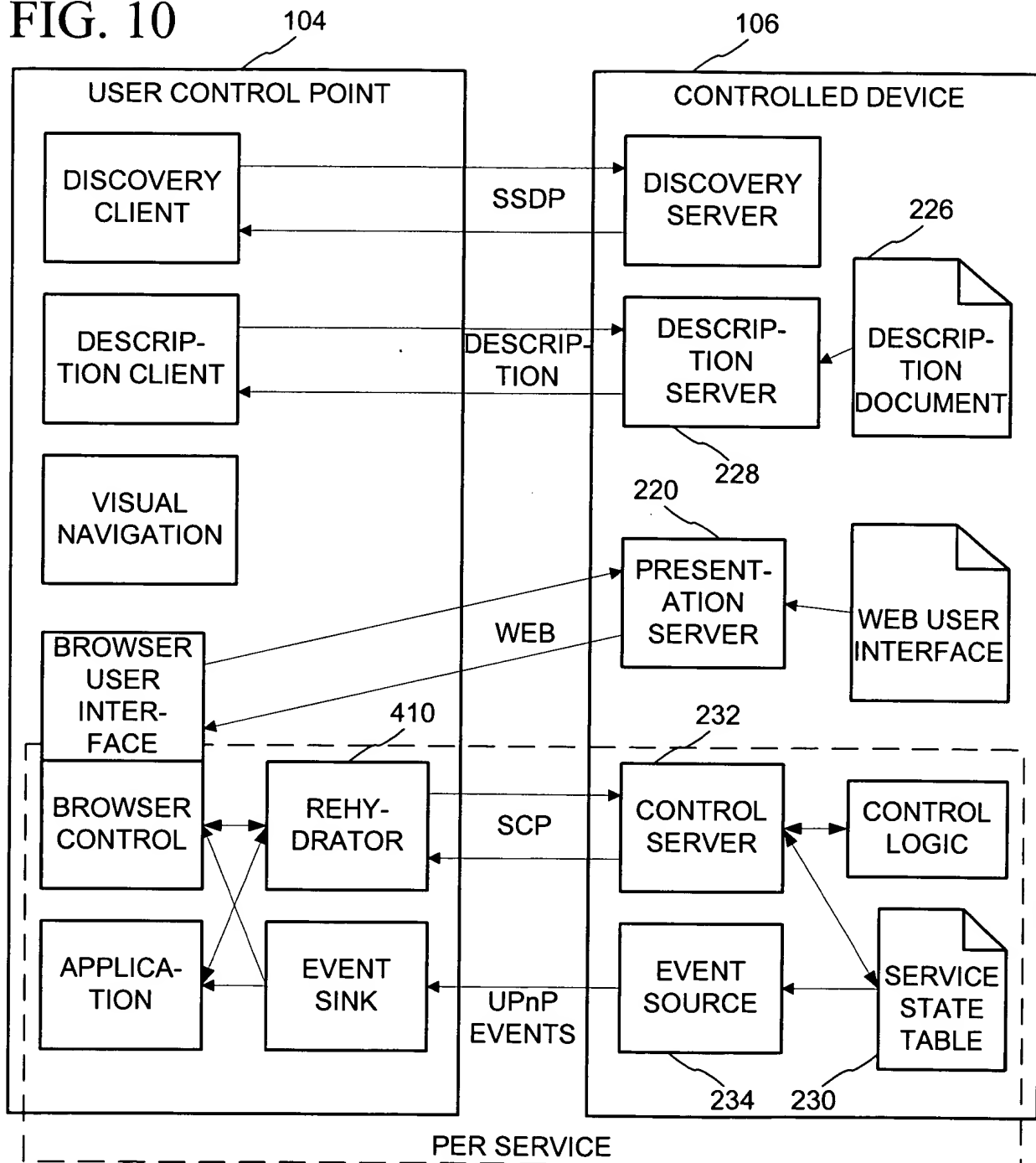


FIG. 9



00207" 9490260

[illegible]

Journal of Interpersonal Violence

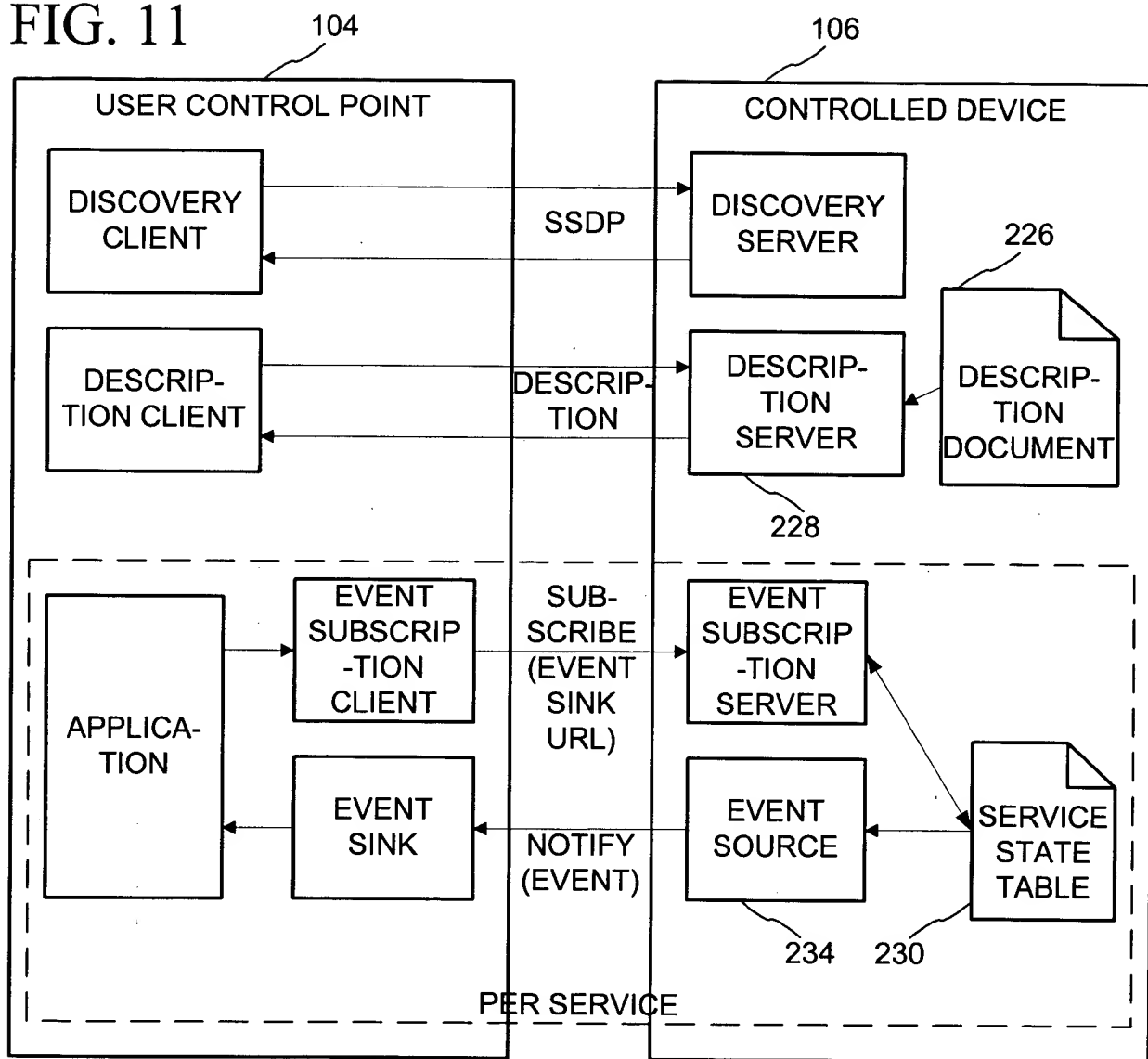
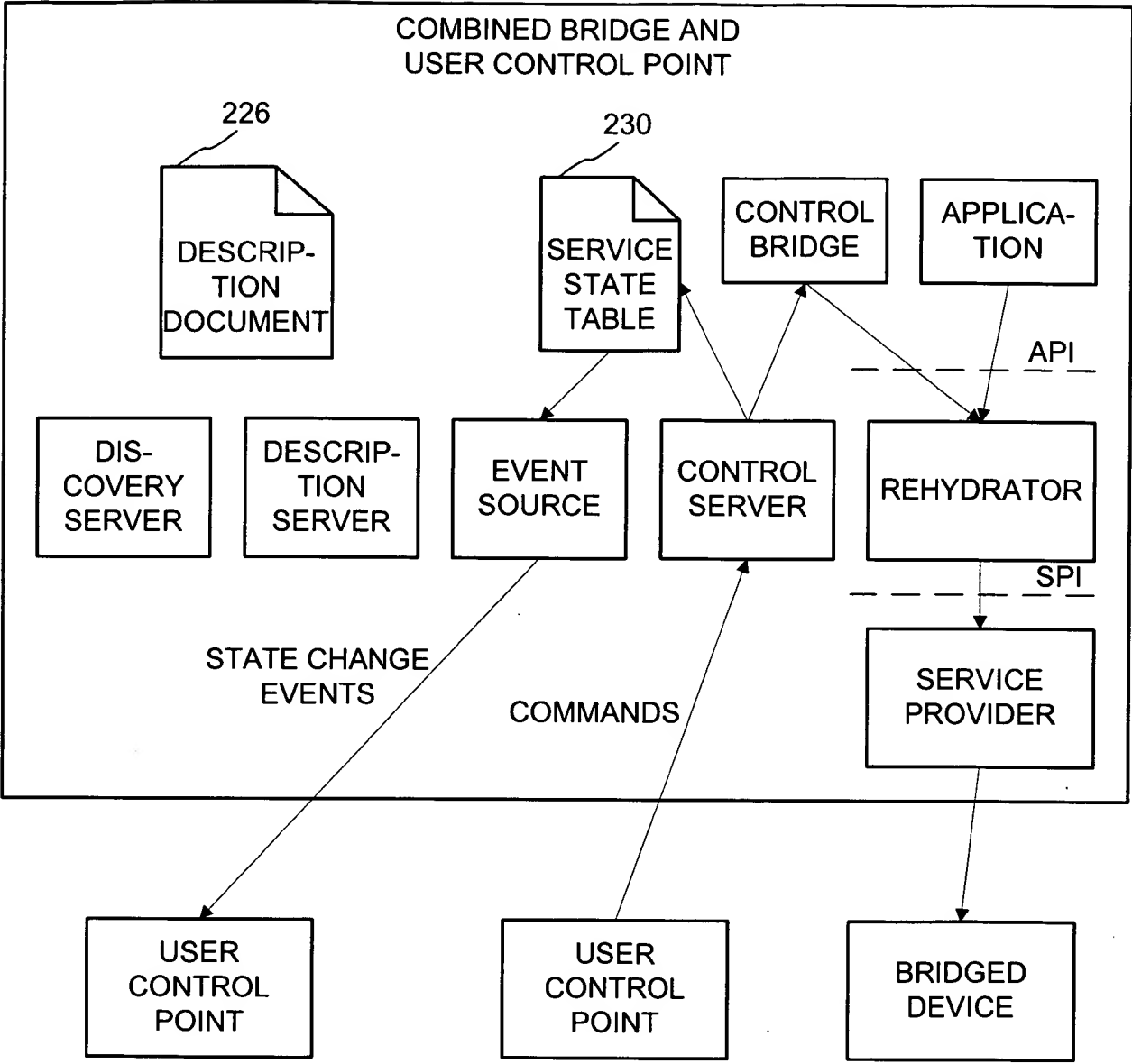
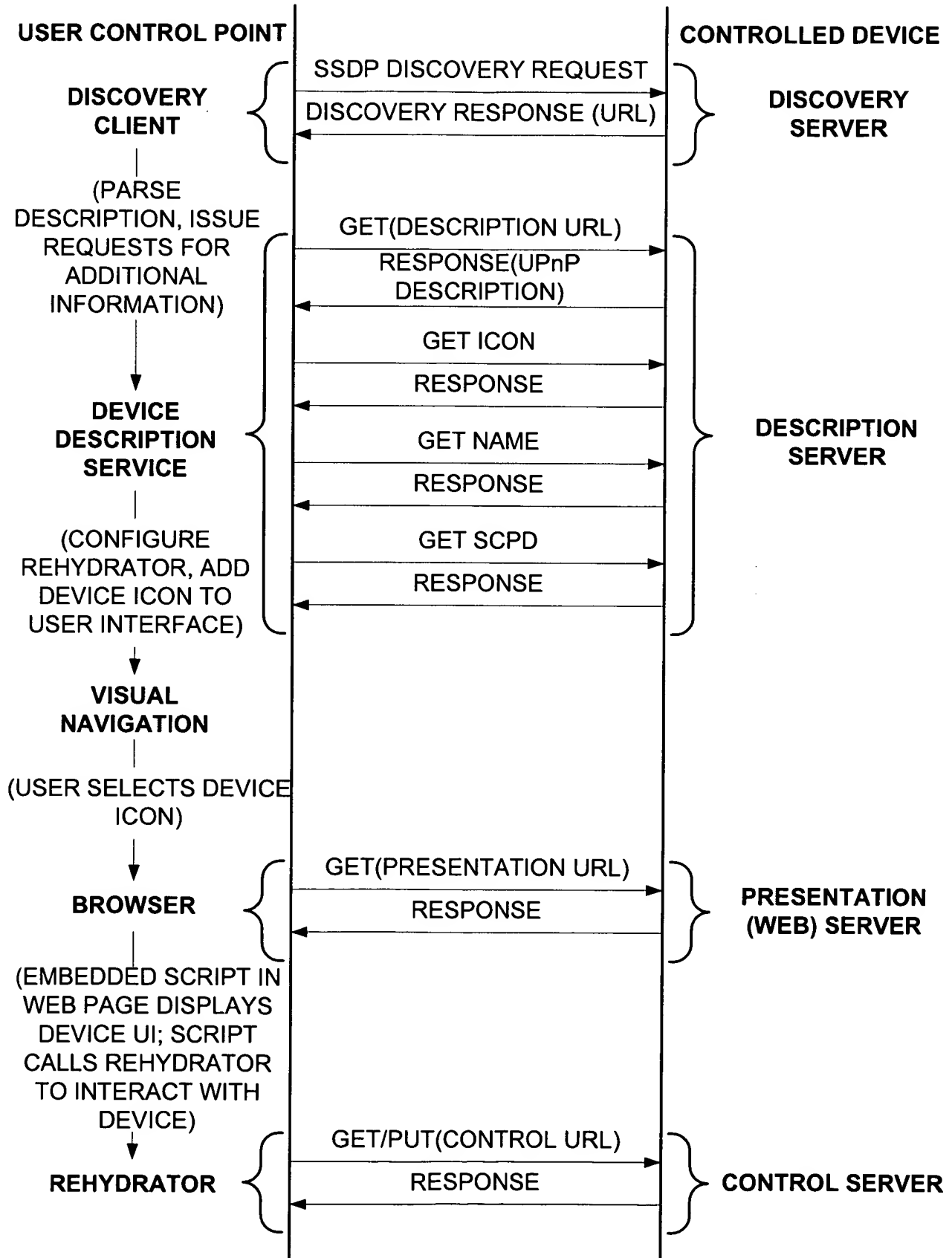


FIG. 12



00207-3490250

FIG. 13



09706446-11000

FIG. 14

```

<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <URLBase>base URL for all relative URLs</URLBase>
  <device>
    <deviceType>urn:schemas-upnp-org:device:deviceType:v</deviceType>
    <friendlyName>short user-friendly title</friendlyName>
    <manufacturer>manufacturer name</manufacturer>
    <manufacturerURL>URL to manufacturer site</manufacturerURL>
    <modelDescription>long user-friendly title</modelDescription>
    <modelName>model name</modelName>
    <modelName>model number</modelName>
    <modelURL>URL to model site</modelURL>
    <serialNumber>manufacturer's serial number</serialNumber>
    <UDN>uuid:UUID</UDN>
    <UPC>Universal Product Code</UPC>
    <iconList>
      <icon>
        <mimetype>image/format</mimetype>
        <width>horizontal pixels</width>
        <height>vertical pixels</height>
        <depth>color depth</depth>
        <url>URL to icon</url>
      </icon>
      XML to declare other icons, if any, go here
    </iconList>
    <serviceList>
      <service>
        <serviceType>urn:schemas-upnp-org:service:serviceType:v</serviceType>
        <serviceId>urn:upnp-org:serviceId:serviceID</serviceId>
        <SCPDURL>URL to service description</SCPDURL>
        <controlURL>URL for control</controlURL>
        <eventSubURL>URL for eventing</eventSubURL>
      </service>
      Declarations for other services (if any) go here
    </serviceList>
    <deviceList>
      Description of embedded devices (if any) go here
    </deviceList>
    <presentationURL>URL for presentation</presentationURL>
  </device>
</root>

```


FIG. 16

```

<?xml version="1.0"?>
<scpd xmlns="urn:schemas-upnp-org:service-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <actionList>
    <action>
      <name>actionName</name>
      <argumentList>
        <argument>
          <name>formalParameterName</name>
          <direction>in xor out</direction>
          <retval />
          <relatedStateVariable>stateVariableName</relatedStateVariable>
        </argument>
        Declarations for other arguments (if any) go here
      </argumentList>
    </action>
    Declarations for other actions (if any) go here
  </actionList>
  <serviceStateTable>
    <stateVariable sendEvents="yes">
      <name>variableName</name>
      <dataType>variable data type</dataType>
      <defaultValue>default value</defaultValue>
      <allowedValueList>
        <allowedValue>enumerated value</allowedValue>
        Other allowed values (if any) go here
      </allowedValueList>
    </stateVariable>
    <stateVariable sendEvents="yes">
      <name>variableName</name>
      <dataType>variable data type</dataType>
      <defaultValue>default value</defaultValue>
      <allowedValueRange>
        <minimum>minimum value</minimum>
        <maximum>maximum value</maximum>
        <step>increment value</step>
      </allowedValueRange>
    </stateVariable>
    Declarations for other state variables (if any) go here
  </serviceStateTable>
</scpd>

```

FIG. 17

```
<?xml version="1.0"?>
<Schema name="upnp_scpdl"
  xmlns="urn:schemas-microsoft-com:xml-data"
  xmlns:dt="urn:schemas-microsoft-com:datatypes">

  <!-- Common Elements and Attributes -->

  <ElementType name="name" content="textOnly" dt:type="string" />

  <!-- Service State Table -->

  <ElementType name="minimum" content="textOnly" dt:type="number" />
  <ElementType name="maximum" content="textOnly" dt:type="number" />
  <ElementType name="step" content="textOnly" dt:type="number" />

  <ElementType name="allowedValueRange" content="eltOnly" model="closed">
    <element type="minimum" />
    <element type="maximum" />
    <element type="step" minOccurs="0" />
  </ElementType>

  <ElementType name="allowedValue" content="textOnly" />

  <ElementType name="allowedValueList" content="eltOnly" model="closed">
    <element type="allowedValue" minOccurs="1" maxOccurs="*" />
  </ElementType>

  <ElementType name="dataType" content="textOnly" dt:type="string" />

  <ElementType name="stateVariable" content="eltOnly" model="closed">
    <element type="name" />
  ...
```


FIG. 18

...

```
<element type="dataType" />

<group minOccurs="0" maxOccurs="1" order="one">
  <element type="allowedValueRange" />
  <element type="allowedValueList" />
</group>
</ElementType>

<ElementType name="deviceStateTable" content="eltOnly" model="closed">
  <element type="stateVariable" minOccurs="1" maxOccurs="*" />
</ElementType>

<!-- Action List -->

<ElementType name="relatedStateVariable" content="textOnly" dt:type="string" />

<ElementType name="argument" content="eltOnly" model="closed">
  <element type="name" />
  <element type="relatedStateVariable" />
</ElementType>

<ElementType name="action" content="eltOnly" model="closed">
  <element type="name" />
  <element type="argument" minOccurs="0" maxOccurs="*" />
</ElementType>

<ElementType name="actionList" content="eltOnly" model="closed">
  <element type="action" minOccurs="0" maxOccurs="*" />
</ElementType>

<!-- Root Element -->

<ElementType name="dcpd" content="eltOnly" model="closed">
  <element type="deviceStateTable" />
  <element type="actionList" />
</ElementType>
</Schema>
```

FIG. 19

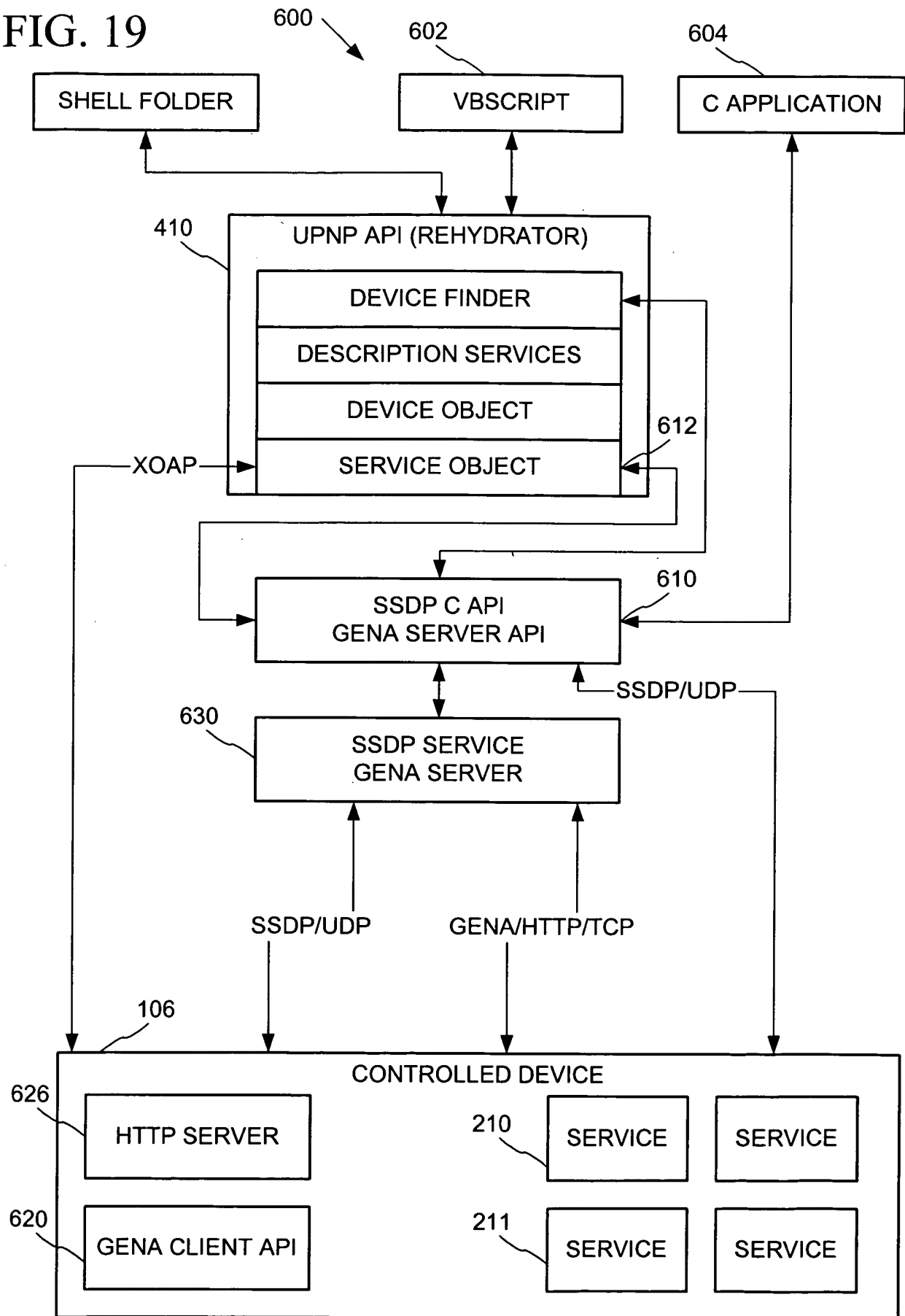


FIG. 20

USER CONTROL POINT

CONTROLLED DEVICE

RegisterNotification()

SUBSCRIBE (Callback + Timeout)

RegisterEventSource()

RESPONSE: SID + TIMEOUT

NOTIFY (SID)

SubmitUpnpProperty-
Event()

200 OK

NOTIFY (SID)

SubmitUpnpProperty-
Event()

200 OK

UNSUBSCRIBE (SID)

DeRegisterNotification()

200 OK

002015-11-10 14:00:00

FIG. 21

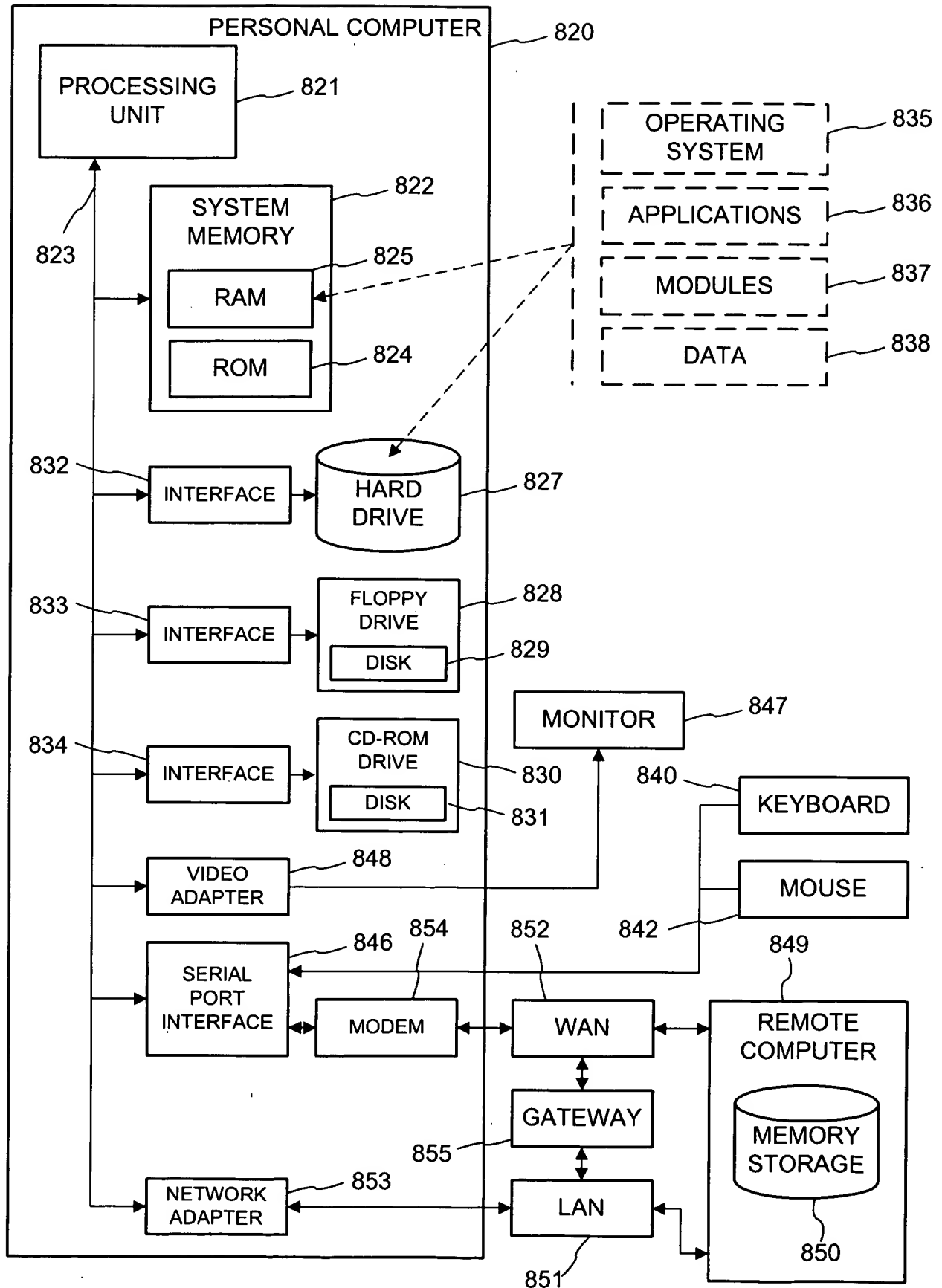


FIG. 22

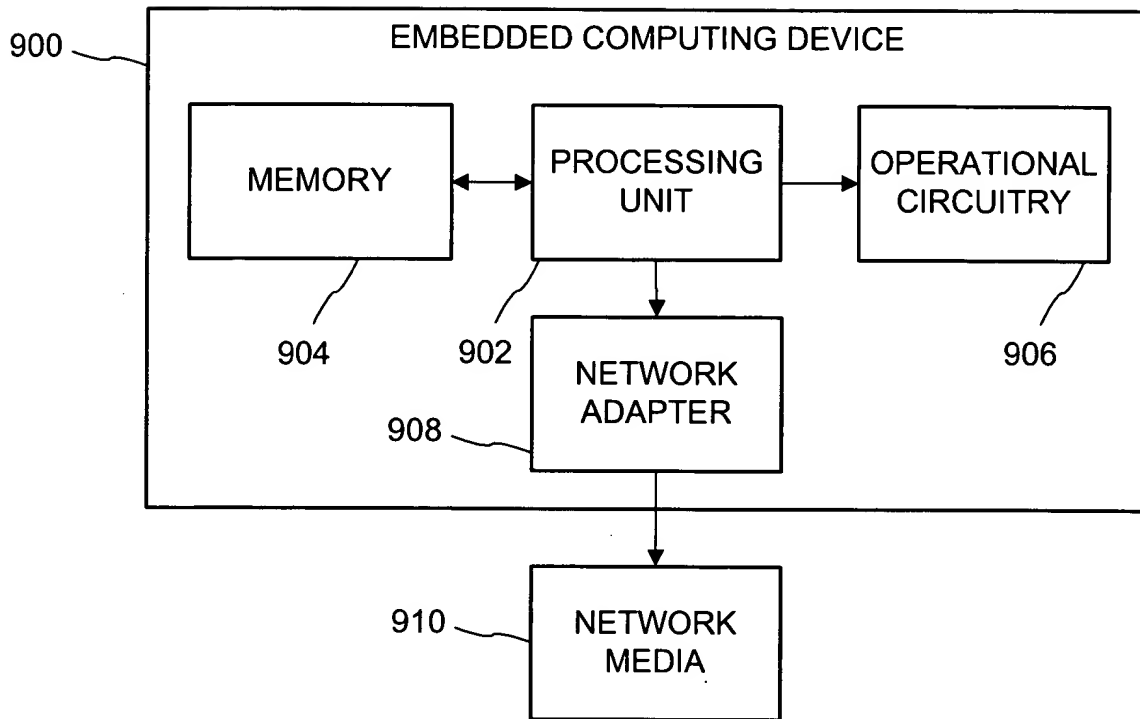
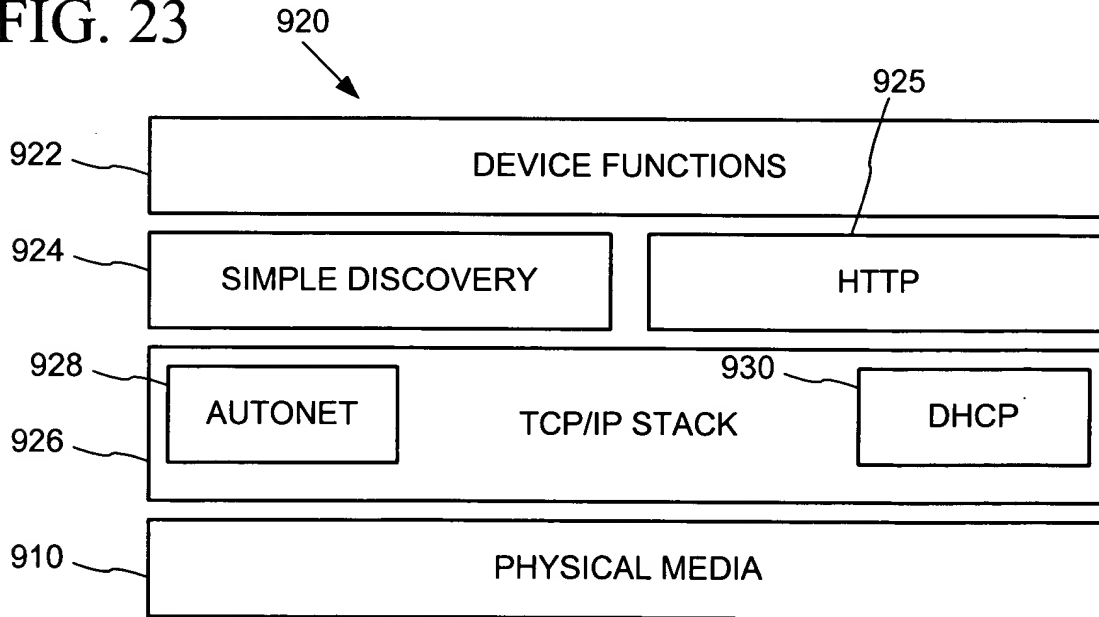
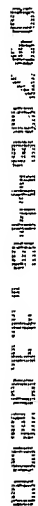


FIG. 23



SECRET



SECRET

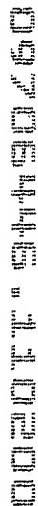


FIG. 26

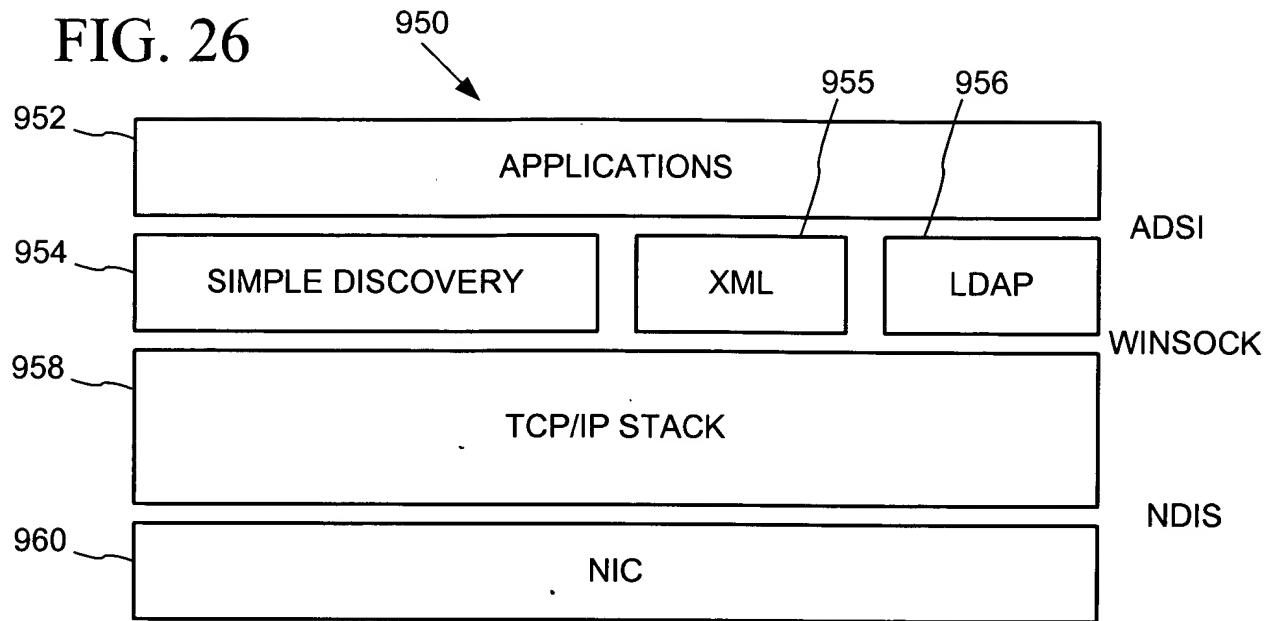
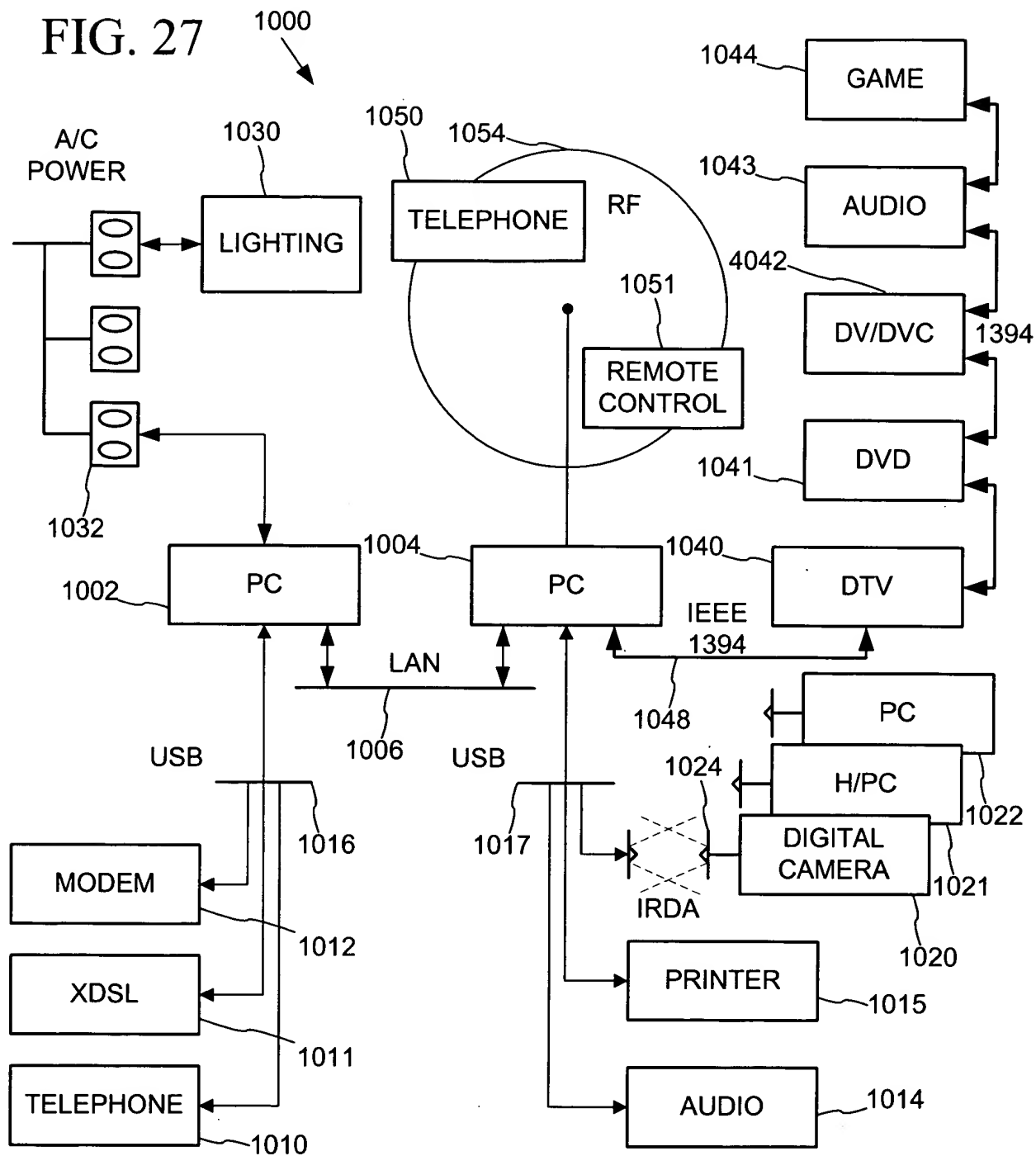


FIG. 27



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FIG. 28

```
[
  object,
  uuid(<foo>),
  dual,
  helpstring("IUPNPDevice interface"),
  pointer_default(unique)
]
interface IUPNPDevice : IDispatch
{

  [propget, id(DISPID_UPNPDEVICE_DESCRIPTIONDOCUMENT),
   helpstring("returns the document from which the properties of this device are
   being read")]
  HRESULT DescriptionDocument([restricted, hidden, out, retval]
  IUPNPDescriptionDocument ** ppuddDocument);
    purpose: returns the document from which the properties of this device are
    being read.
    parameters: ppuddDocument, A reference to the description document
    object from which data about the device is being read. This must be freed when no
    longer needed.
    return values: S_OK, ppuddDocument is a reference to the device's
    description document.

  [propget, id(DISPID_UPNPDEVICE_ISROOTDEVICE),
   helpstring("denotes whether the physical location information of this device can
   be set")]
  HRESULT IsRootDevice([out, retval] VARIANT_BOOL * pvarb);
    parameters: pvarb, the address of a VARIANT_BOOL that will receive the
    value of VARIANT_TRUE if the current device is the topmost device in the device
    tree, and will receive the value of VARIANT_FALSE otherwise.
    return values: S_OK, varb is set to the appropriate value
    note: if a device is a root device, calls RootDevice() or ParentDevice() will
    return NULL

  [propget, id(DISPID_UPNPDEVICE_ROOT),
   helpstring("returns the top device in the device tree")]
  HRESULT RootDevice([out, retval] IUPNPDevice ** ppudDeviceRoot);
    purpose: returns the top device in the device tree
  ...
}
```

FIG. 29

...
parameters: ppudDeviceRoot, On return, this refers to the "root" device of the current device tree. The root device is the topmost parent of the current device. If the current device is the root device this method will set *ppudDeviceRoot to null, and return S_FALSE.

return values: S_OK, *ppudDeviceRoot contains a reference to the root device. S_FALSE, the current device is the root device. *ppudDeviceRoot is null.

[propget, id(DISPID_UPNPDEVICE_PARENT),
helpstring("returns the parent of the current device")]
HRESULT ParentDevice([out, retval] IUPNPDevice ** ppudDeviceParent);

parameters: ppudDeviceParent, On return, if the device has a parent, this is the address of a IUPNPDevice object which can describe the parent. This must be released when no longer needed. If the device has no parent (it is a "root" device), then this value will be set to null.

return values: S_OK, ppudDeviceParent contains a reference to the device's parent. S_FALSE, the current device is the root device, which has no parent. *ppudDeviceRoot is null.

[propget, id(DISPID_UPNPDEVICE_CHILDREN),
helpstring("returns a collection of the children of the current device")]
HRESULT Children([out, retval] IUPNPDevices ** ppudChildren);

parameters: ppudChildren, On return, this is the address of a newly-created IUPNPDevices collection that can enumerate this device's children. This must be released when no longer needed. If the device has no children, this method will return a collection object with a length of zero.

return values: S_OK, ppudChildren contains a list of the device's children.

[propget, id(DISPID_UPNPDEVICE_UDN),
helpstring("returns the UDN of the device")]
HRESULT UniqueDeviceName([out, retval] BSTR * pbstrUDN);

parameters: pbstrUDN, On return, this contains the address of a newly-allocated string which contains the device's Unique Device Name (UDN). The UDN is globally unique across all devices - no two devices will ever have the same UDN. This value must be freed when no longer needed.

return values: S_OK pbstrUDN contains the UDN of the device
...

FIG. 31

```
...
    helpstring("returns the device type URI")]
HRESULT Type([out, retval] BSTR * pbstrType);
    parameters: pbstrType, On return, this contains the address of a newly-allocated
string containing the device's type URI. This value must be freed when no longer
needed.
    return values: S_OK, bstrType contains the type URI of the device, and must be
freed when no longer needed.
```

```
[propget, id(DISPID_UPNPDEVICE_SERVICES),  
    helpstring("returns the collection of services exposed by the device")]  
HRESULT Services([out, retval] IUPNPServices ** ppusServices);  
    parameters: ppusServices, On return, this is the address of a newly-created  
IUPNPServices collection that can enumerate the services exposed by the device.  
This must be released when no longer needed. If the device exposes no services, this  
method will return a collection object with a length of zero.  
    return values: S_OK, pusServices contains a list of the device's children.
```

[propget, id(DISPID_UPNPDEVICE_SERVICEIDENTIFIER),
helpstring("returns the (optional) service identifier of the device")]
HRESULT ServiceIdentifier([out, retval] BSTR * pbstrServiceID);

parameters: pbstrServiceID, On return, this contains the address of a newly-allocated string containing the contents of the device's ServiceIdentifier element, if the device specifies one. This value must be freed when no longer needed. If the device does not specify a ServiceIdentifier value, this parameter will be set to null.

return value: S_OK, bstrServiceID contains the service identifier of the device. pbstrServiceID must be freed. S_FALSE, the device did not specify a service identifier. *pbstrServiceID is set to null.

note having a ServiceIdentifier is mutually exclusive with having services. Any device will either have a list of services or a ServiceIdentifier, but not both.

```
[id(DISPID_UPNPDEVIDEDESCRIPTION_LOADSMALLICON),
  helpstring("loads a small (titlebar-sized) icon representing the device, encoded in the
specified format")]
HRESULT LoadSmallIcon([in] BSTR bstrEncodingFormat,
  [out, retval] BSTR * pbstrIconURL);
  parameters:
```

...

pbstrEncodingFormat, A string containing the mime-type representing the desired encoding format of the icon. **pbstrIconURL**, On return, ***pbstrIconURL** contains a newly-allocated string representing the URL from which the icon can be loaded. This string must be freed when no longer needed.

return values: S_OK, *pbstrIconURL contains a reference to an icon, encoded in the desired encoding format.

```
[id(DISPID_UPNPDEVICEDESCRIPTION_LOADICON),  
    helpstring("loads a standard-sized icon representing the device, encoded in the  
specified format")]
```

```
HRESULT LoadIcon([in] BSTR bstrEncodingFormat,  
[out, retval] BSTR * pbstrIconURL);
```

parameters: `bstrEncodingFormat`, A string containing the mime-type representing the desired encoding format of the icon. `pbstrIconURL`, On return, `*pbstrIconURL` contains a newly-allocated string representing the URL from which the icon can be loaded. This string must be freed when no longer needed.

return values: S_OK, *pbstrIconURL contains a reference to an icon, encoded in the desired encoding format.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_PRESENTATIONURL),  
    helpstring("obtains a presentation URL to a web page that can control the  
device")]
```

```
HRESULT PresentationURL([out, retval] BSTR * pbstrURL);
```

parameters: pbstrURL, on return, the address of a newly-allocated string containing the web-page-based control URL. If the device did not specify a presentation URL, an empty string ("") will be returned.

return values: S_OK, bstrURL contains a newly-allocated URL that must be freed when no longer needed. S_FALSE, the device does not have a presentation URL. pbstrURL is set to null.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_PHYSICALLOCATION),  
helpstring("a set of properties describing the device's physical location")]
```

```
HRESULT PhysicalLocation([out, retval] IUPNPPPropertyBag * pUp);
```

parameters: `upnp` on return, the address of a newly-allocated `UPNPPropertyBag` object which contains information about the device's physical location

return values

...

FIG. 33

...

S_OK upl contains a newly-allocated object that the caller must free when it is no longer needed.

note: if the object does not provide any description information, an empty property bag will be returned. See SetPhysicalLocation for a listing of defined values in a physical location property bag.

[propget,
id(DISPID_UPNPDEVICEDESCRIPTION_CANSETPHYSICALLOCATION),
helpstring("denotes whether the physical location information of this device can be set")]

HRESULT CanSetPhysicalLocation([out, retval] VARIANT_BOOL * pvarb);
parameters: pvarb the address of a VARIANT_BOOL. This is true (!=0) on return when the device's physical location can be set (via SetPhysicalLocation)
return values: S_OK varb is set to the appropriate value

[id(DISPID_UPNPDEVICEDESCRIPTION_SETPHYSICALLOCATION),
helpstring("writes a set of properties describing the device's physical location to the device")]

HRESULT SetPhysicalLocation([in] IUPNPPropertyBag * pupl);
parameters: pupl A UPNPPropertyBag object which contains the name-value pairs representing the device's current location. the function will not free the object.

return values: S_OK the device has been updated with the supplied physical location information

note: the following are standard values in the physical location property bag: country, campus, building, floor, wing, room, latitude, longitude, altitude. These values can be used programmatically to implement sorting or filtering functionality based on the device's location. Additionally the property bag supports the following value: description, which contains a user-displayable string representing a device's location which does not have programmatic significance. Additionally, the physical location update will be made on the device alone, and will not be reflected in the current device object. After a successful call to this method, PhysicalLocation will continue to return the 'old' value. To read the device's current name, the caller must re-load the device's description.

}

...

FIG. 34

...

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_PRODUCTNAME),
    helpstring("a displayable string containing the product name")]
HRESULT ProductName([out, retval] BSTR * pbstr);
```

parameters: pbstr on return, the address of a newly-allocated string containing the product name of the device.

return values: S_OK pbstr contains a newly-allocated string that must be freed when no longer needed.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_DESCRIPTION),
    helpstring("displayable summary of the device's function")]
HRESULT Description([out, retval] BSTR * pbstr);
```

parameters: pbstr on return, the address of a newly-allocated string containing a short description of the device meaningful to the user.

return values: S_OK pbstr contains a newly-allocated string that must be freed when no longer needed.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_MODELNAME),
    helpstring("displayable model name")]
HRESULT ModelName([out, retval] BSTR * pbstr);
```

parameters: pbstr on return, the address of a newly-allocated string containing the manufacturer's model name of the device.

return values: S_OK pbstr contains a newly-allocated string that must be freed when no longer needed.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_SERIALNUMBER),
    helpstring("displayable serial number")]
HRESULT SerialNumber([out, retval] BSTR * pbstr);
```

parameters: pbstr on return, the address of a newly-allocated string containing the manufacturer's serial number of the device.

return values: S_OK pbstr contains a newly-allocated string that must be freed when no longer needed.

note: a device's serial number is not guaranteed to be globally unique. The DeviceUniqueName should always be used to distinguish devices.

```
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_MANUFACTURERNAME),
    helpstring("displayable manufacturer name")]
HRESULT ManufacturerName([out, retval] BSTR * pbstr);
```

parameters

...

FIG. 35

...

pbstr, on return, the address of a newly-allocated string containing the name of the device's manufacturer.

return values: S_OK, pbstr contains a newly-allocated string that must be freed when no longer needed.

[propget, id(DISPID_UPNPDEVICEDESCRIPTION_MANUFACTURERURL),
helpstring("URL to the manufacturer's website")]

HRESULT ManufacturerURL([out, retval] BSTR * pbstr);

parameters: pbstr, on return, the address of a newly-allocated string containing the URL of the manufacturer's website.

return values: S_OK, pbstr contains a newly-allocated string that must be freed when no longer needed.

[propget, id(DISPID_UPNPDEVICEDESCRIPTION_MODELNAME),
helpstring("displayable model name")]

HRESULT ModelName([out, retval] BSTR * pbstr);

parameters: pbstr, on return, the address of a newly-allocated string containing the manufacturer's model name for the device.

return values: S_OK, pbstr contains a newly-allocated string that must be freed when no longer needed.

[propget, id(DISPID_UPNPDEVICEDESCRIPTION_SUPPORTLIST),
helpstring("technical support contact information")]

HRESULT SupportList([out, retval] BSTR * pbstr);

parameters: pbstr, on return, the address of a newly-allocated, multi-line string containing phone numbers and other information that can guide the user to technical support. This string must be freed when no longer needed.

return values: S_OK, pbstr contains a newly-allocated string that must be freed when no longer needed.

[propget, id(DISPID_UPNPDEVICEDESCRIPTION_FAQLIST),
helpstring("FAQ access display information")]

HRESULT FAQList([out, retval] BSTR * pbstr);

parameters: pbstr, on return, the address of a newly-allocated, multi-line string containing FAQ information that can provide the user with URLs at which device FAQs may be located.

return values: S_OK, pbstr contains a newly-allocated string that must be freed when no longer needed.

...

FIG. 36

```

...
[propget, id(DISPID_UPNPDEVICEDESCRIPTION_UPDATELIST),
    helpstring("information explaining where the user can update the device's
firmware")]
    HRESULT UpdateList([out, retval] BSTR * pbstr);
        parameters: pbstr, on return, the address of a newly-allocated, multi-line
string containing information and URLs from which the user can download updates
for the device's firmware.
        return values: S_OK, pbstr contains a newly-allocated string that must be
freed when no longer needed.

```

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FIG. 37

```
[
    object,
    uuid(FDBC0C73-BDA3-4C66-AC4F-F2D96FDAD68C),
    dual,
    helpstring("IUPNPDevices Interface"),
    pointer_default(unique)
]
IUPNPPropertyBag
{

    [propget, id(DISPID_UPNP_PROPERTYBAG_READ),
    helpstring("reads a value from the property bag")]
    HRESULT Read([in] BSTR bstrName, [out, retval] VARIANT * pvarResult);
        parameters: bstrName, name of the property to read. case is ignored.
        pvarResult value of the property. if the property does not exist, this is of type
        VT_EMPTY
        return values: S_OK, the value was found in the property bag, and returned
        in pvarResult. S_FALSE, there was no value with the given name in the property
        bag. *pvarResult is of type VT_EMPTY

    [propget, id(DISPID_UPNP_PROPERTYBAG_WRITE),
    helpstring("writes a value to the property bag")]
    HRESULT Write([in] BSTR bstrName, [in] VARIANT * pvarValue);
        parameters: bstrName, name of the property to write. case is preserved
        when writing. The supplied value will replace any other values of the same name,
        even if they differ in case. pvarValue, value of the property to write.
        return values: S_OK, the value was written to the property bag, replacing the
        value currently associated with this property, if it existed.

    [propget, id(DISPID_UPNP_PROPERTYBAG_DELETE),
    helpstring("removes a value from the property bag")]
    HRESULT Delete([in] BSTR bstrName);
        parameters: bstrName, name of the value to remove from the property bag.
        case is ignored when finding a value to remove.
        return values: S_OK, the value has been removed from the property bag.
        S_FALSE, the value was not found in the property bag.

};
```

FIG. 38

```

interface IUPnPService : IDispatch
{
    [id(DISPID_UPNPService_QUERYSTATEVARIABLE),
     helpstring("method QueryStateVariable")]
    HRESULT QueryStateVariable([in] BSTR bstrVariableName,
                               [out, retval] VARIANT *pValue);

    [id(DISPID_UPNPService_INVOKEACTION),
     helpstring("method InvokeAction")]
    HRESULT InvokeAction([in] BSTR bstrActionName,
                         [in] VARIANT vlnActionArgs,
                         [in, out] VARIANT * pvOutActionArgs,
                         [out, retval] VARIANT *pvRetVal);

    [propget, id(DISPID_UPNPService_SERVICETYPEIDENTIFIER),
     helpstring("property ServiceTypeIdentifier")]
    HRESULT ServiceTypeIdentifier([out, retval] BSTR *pVal);

    [id(DISPID_UPNPService_ADDSTATECHANGECALLBACK),
     helpstring("method AddStateChangeCallback")]
    HRESULT AddCallback([in] IUnknown * pUnkCallback);

    [propget, id(DISPID_UPNPService_SERVICEID),
     helpstring("property Id")]
    HRESULT Id([out, retval] BSTR *pbstrId);

    [propget, id(DISPID_UPNPService_LASTTRANSPORTSTATUS),
     helpstring("property LastTransportStatus")]
    HRESULT LastTransportStatus([out, retval] long * pIValue);
};

```

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FIG. 39

```
[
  object,
  uuid(FDBC0C73-BDA3-4C66-AC4F-F2D96FDAD68C),
  dual,
  helpstring("IUPNPDevices Interface"),
  pointer_default(unique)
]
interface IUPNPDevices : IDispatch
{
  [propget, id(1), helpstring("property Count")]
  HRESULT Count(
    [out, retval] long *pVal
  );

  [propget, id(DISPID_NEWENUM), helpstring("property _NewEnum")]
  HRESULT _NewEnum(
    [out, retval] LPUNKNOWN *pVal
  );

  [propget, id(DISPID_VALUE), helpstring("property Item")]
  HRESULT Item(
    [in] long lIndex,
    [out, retval] VARIANT *pVal
  );
};
```

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FIG. 40

```
[
  object,
  uuid(3F8C8E9E-9A7A-4DC8-BC41-FF31FA374956),
  dual,
  helpstring("IUPNPServices Interface"),
  pointer_default(unique)
]
interface IUPNPServices : IDispatch
{
  [propget, id(1), helpstring("property Count")]
  HRESULT Count(
    [out, retval] long *pVal
  );

  [propget, id(DISPID_NEWENUM), helpstring("property _NewEnum")]
  HRESULT _NewEnum(
    [out, retval] LPUNKNOWN *pVal
  );

  [propget, id(DISPID_VALUE), helpstring("property Item")]
  HRESULT Item(
    [in] long lIndex,
    [out, retval] VARIANT *pVal
  );
};
```

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